



Don't Limit our Toolbox to Fight Rising CO₂

Opinion Editorial piece by Brian McPherson, Ph.D
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For those who don't believe that humans are contributing to global warming, this editorial won't change your mind. However, if you do agree that humankind has a responsibility to reduce CO₂ in our atmosphere, I hope to convey how important the science of Carbon Capture and Storage (CCS) is to our "toolbox" of resources to achieve this goal.

The simple idea is to capture CO₂ emissions from coal-fired power plants and other sources and store them deep underground, just as nature has stored natural gas for millennia. Such storage can buy us time to develop other technologies needed to transition us away from carbon-based energy.

Unfortunately, some in the environmental community are resisting CCS, as a recent report from GreenPeace indicates. Critics argue that the technology is unproven and that CCS "enables" our addiction to carbon-based energy. Greenpeace contends that "renewable energy, combined with greater energy efficiency, can cut global CO₂ emissions by almost 50%, and deliver half the world's energy needs by 2050." While I do not disagree with this very optimistic assertion, we can't wait until 2050. If we do, permanent and irreversible damage may already have been done.

Beyond GreenPeace's report, numerous groups have recently completed studies about CCS and its potential costs and risks. These include the U.S. Congressional Budget Office, the Electric Power Research Institute, and university-based studies by Princeton, Stanford and M.I.T. All of these studies conclude that the "silver bullet" to solve the global carbon-emissions problem does not exist. Rather, we need a portfolio of options, with a tiered set of deployment time frames. We need short-term, mid-term, and long-term solutions.

Efficiency measures can be implemented immediately. Renewables (wind, solar and geothermal) can be employed now, but it will take many years to replace significant percentages of carbon-based generation. Even nuclear power must be considered, although it will take decades to build more plants.



Simply put, to replace all coal-fired power plants with new forms of energy will require many decades. In fact, even the most aggressive projections of renewable energy development demonstrate a clear need for CCS to achieve 1990 emission levels before it's too late.

Contrary to the skeptics, CCS is much closer to being ready for "prime time" than many other carbon-reducing approaches. CO₂ has been injected into the subsurface for enhanced oil recovery for several decades. We have developed sophisticated computer models that forecast the technology to be safe and feasible. Many small-scale, real-world tests have confirmed our hypotheses. Now, we are examining market-scale carbon storage to complete our testing. Within six months, we will begin the largest single-injection storage project in the U.S. At our site near Price, Utah, we will inject one million tons of liquid CO₂ per year and use sophisticated monitoring to determine the safety of the technology.

If large-scale tests, such as ours, are successful, CCS could be implemented relatively quickly. Coal and natural gas power plants in the west are generally located close to good geologic storage sites. Existing pipelines could be utilized to transport CO₂. And significant storage infrastructure could be in place as early as 2020.

If our tests show that CCS can be fully realized, then this technology will have enormous benefits for Utah. First, it will allow thousands of Utahns employed in the energy sector to continue to earn a living, while new technologies and jobs can be created. Likewise, Utah's geology provides excellent storage opportunities, which can bring revenue to the state, especially given that nearby states, like California, have fewer carbon storage options. And, most importantly, CCS can give innovators working on renewables – and there are many such innovators in Utah, including some of my USTAR colleagues – time to develop the technology we need to break our dependence on fossil fuels while maintaining the quality of life we have all come to expect.

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The Utah Science Technology and Research initiative (USTAR) is a long-term, state-funded investment to strengthen Utah's "knowledge economy" and generate high-paying jobs. Funded in March 2006 by the State Legislature, USTAR is based on three program areas. The first area involves funding for strategic investments at the University of Utah and Utah State University to recruit world-class researchers. The second area is to build state-of-the-art interdisciplinary facilities at these institutions for the innovation teams. The third program area involves teams that work with companies and entrepreneurs across the State to promote science, innovation, and commercialization activities. For more information, go to www.innovationutah.com.